



**REMOVAL ACTION PLAN
LENNON WALLPAPER SITE
JOLIET, WILL COUNTY, ILLINOIS**

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 5 Emergency Response Branch
77 West Jackson Boulevard, 5th Floor
Chicago, IL 60604

TDD No.:	S05-0106-012
Date Prepared:	04 Sept 02
Contract No.:	68-W-00-129
Prepared by:	Tetra Tech EM Inc.
Tetra Tech START Project Manager:	Lee Christenson
Telephone No.:	(312) 946-6457
U.S. EPA On-Scene Coordinator:	Sonia Vega
Telephone No.:	(312) 886-7191

CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1
2.0 SITE BACKGROUND	2
2.1 SITE DESCRIPTION	2
2.2 SITE HISTORY	4
3.0 SITE ASSESSMENT ACTIVITIES	6
3.1 SAMPLING ACTIVITIES	6
3.2 SAMPLE ANALYSIS	8
4.0 ANALYTICAL RESULTS	10
5.0 POTENTIAL SITE-RELATED THREATS	13
6.0 PROPOSED ACTIONS AND ESTIMATED COSTS	15
7.0 SUMMARY	17

Appendix

A	PHOTOGRAPHIC LOG
B	DATA VALIDATION REPORTS AND VALIDATED ANALYTICAL RESULTS
C	REMOVAL COST ESTIMATES

FIGURES

<u>Figure</u>	<u>Page</u>
1 SITE LOCATION MAP	3
2 SITE LAYOUT AND SAMPLING LOCATION MAP	7

TABLES

<u>Table</u>	<u>Page</u>
1 ANALYTICAL RESULTS	11



1.0 INTRODUCTION

The Tetra Tech EM Inc. Superfund Technical Assessment and Response Team (START) was tasked to perform a site assessment at the Lennon Wallpaper site in Joliet, Will County, Illinois, by the U.S. Environmental Protection Agency (U.S. EPA) under Technical Direction Document (TDD) No. S05-0106-012. Specifically, START was assigned to review available site information, develop a site safety plan, collect investigative soil samples, procure an analytical laboratory, provide photographic documentation of site activities with a still camera, provide a written log documenting site activities, evaluate potential threats to human health and the environment posed by the site, delineate the extent of site contamination, prepare removal cost estimates, and prepare this removal action plan.

The site assessment was performed in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) in Title 40 *Code of Federal Regulations* (CFR) Section 300.415 to evaluate site conditions and possible threats to human health, public welfare, and the environment. This removal action plan discusses site background information, site assessment activities, sample analytical results, potential site-related threats, and proposed actions and estimated costs and includes a summary of the assessment. Appendix A contains a photographic log of site activities, Appendix B contains data validation reports and validated analytical results for site samples collected by START, and Appendix C contains removal cost estimates for the site.



2.0 SITE BACKGROUND

This section describes the Lennon Wallpaper site and discusses the site history, including previous environmental investigations at the site.

2.1 SITE DESCRIPTION

The Lennon Wallpaper site consists of seven parcels covering about 12 acres of land near 807 4th Avenue in Joliet, Will County, Illinois (see Figure 1). The site is in the Southwest 1/4 of the Northwest 1/4 of Section 14, Township 35 North, Range 10 East of the Third Principal Meridian in Will County. The geographic coordinates of the site are 41° 31.1583' north latitude and 88° 03.6138' west longitude. Adjacent to the site are private residences to the north and west and an abandoned rock quarry to the south. The area of interest for the site assessment is an open, un-vegetated area in the northwest portion of the site.

The un-vegetated assessment area is located near Parcel 5 on the east side of Boulder Avenue. Parcel 5 is completely surrounded by a chain-link fence; however, there are some large holes in the fence. Parcel 5 is bordered on the north by a wetland, on the west by railroad tracks, on the south by Grant Avenue (vacant), and on the east by Preston Place (vacant).

The assessment area appears to have been a wetland based on the presence of wetland vegetation (such as cattails) around the perimeter of the area. Vegetation apparently attempts to grow in this area but may be stressed by contamination. The area is empty except for some scattered debris (tires, boards, and trash).



2.2 SITE HISTORY

The Lennon Wallpaper facility began operations at the site in 1919. The facility covered about 12 acres. In 1954, the Lennon family sold most of the company to William Strickland, who then sold a portion of the company to Walter Mueller in 1966. In 1981, the company's assets were sold to Thomas Industries, which was bought out by North American Decorative Products in 1988. The Lennon Wallpaper facility ceased operations in 1989. Since the closure of the facility, parcels of the site property have been sold; these parcels are currently used for storage of wood debris, cinder blocks, and other landscaping materials. Previous environmental investigations have been conducted on all seven parcels of the site property.

After the Lennon Wallpaper facility ceased operations in 1989, the Illinois Environmental Protection Agency (IEPA) collected sediment and soil samples throughout the site in 1990 to determine the environmental impacts of the former operations. Sample analytical results indicated high concentrations of contamination (primarily metals) at the site. Based on this information, in Apr 90 IEPA issued a 4(q) notice 90 to all potentially responsible parties (PRP) to conduct a remedial investigation and feasibility study (RI/FS) for the site. The PRPs appeared to take no action to satisfy the conditions of the 4(q) notice. The Lennon Wallpaper site was placed in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) in 1991.

Following a screening site inspection in 1992, IEPA decided to conduct an expanded site inspection (ESI) in May 95. During the ESI, soil samples were collected from 13 locations throughout the abandoned facility and on neighboring residential properties. Samples were collected from the 0- to 6-inch below ground surface (bgs) interval and were analyzed for Target Compound List (TCL) parameters. Sample analytical results from the ESI indicated the presence of elevated concentrations of inorganic contamination in soil on the site property.

In Apr 00, IEPA conducted a site characterization and used an x-ray fluorescence (XRF) spectrum analyzer to screen soil at 61 locations throughout the site property. Samples collected from 0 to 2.5 feet bgs were screened for inorganic contamination. The XRF spectrum analyzer indicated the presence of elevated concentrations of inorganics. Lead concentrations were particularly elevated, with one result as high as 59,955 parts per million (ppm).



On 24 and 26 Jul 01, U.S. EPA on-scene coordinator (OSC) Walter Nied and START conducted a removal evaluation at the site as part of the site assessment activities. On 29 Mar 02, U.S. EPA OSC Sonia Vega and START conducted additional removal evaluation activities at the site. U.S. EPA's and START's site assessment activities are described in Section 3.0.



3.0 SITE ASSESSMENT ACTIVITIES

Site assessment activities included collection of soil samples and sample analysis. These activities are discussed below.

3.1 SAMPLING ACTIVITIES

At 0900 on 24 Jul 01, U.S. EPA OSC Walter Nied and START members Lee Christenson and Jodi McCarty arrived at the Lennon Wallpaper site to conduct a removal evaluation. To evaluate whether the site posed a threat to human health or the environment from contaminated soil, START conducted soil sampling. A total of 12 samples were collected from 10 locations in the un-vegetated area in the northwest portion of the site property. The sampling locations were selected by START and OSC Nied and are shown in Figure 2.

The 10 sampling locations were sequentially numbered LW-1 through LW-10. Of the 12 samples collected, 2 samples were collected from location LW-1, 1 sample and 1 duplicate sample were collected from location LW-6, and 1 sample was collected from each of the remaining eight locations. The soil samples were collected from a distinct layer of clay-like material that covered the entire un-vegetated area. The material was generally pinkish-grey in color, contained a glittering substance, and exhibited multicolored layers. The material extended to about 2 feet bgs, where dark brown, organic silts and sands were encountered. Samples were collected at varying depths between the ground surface and the material's interface with native silts and sands at about 2 feet bgs. For the purposes of the site assessment, samples were collected using a hand auger and were homogenized with gloved hands in stainless-steel bowls. After sample collection, each sampling location was marked with an orange flag. All sampling equipment was decontaminated between sampling locations.

When sample collection had been completed, START wrapped the samples in bubble-wrap, placed them in a cooler on ice, and shipped them for overnight delivery to Suburban Laboratories (Suburban) in Hillside, Illinois. The sample analytical parameters are discussed in Section 3.2.



Figure 2 Site Layout and Sampling Location Map



At 0845 on 26 Jul 01, OSC Nied and START member Lee Christenson returned to the Lennon Wallpaper site in order to identify all the sampling locations using a global positioning system (GPS) unit. In addition, Suburban had notified START on 25 Jul 01 that the sample containers for locations LW-8 and LW-10 had been broken during shipment. As a result, START re-sampled these locations on 26 Jul 01 and shipped the two new samples for overnight delivery to Suburban. After sample shipment, Suburban informed START that Suburban had misplaced three site samples: LW-6, LW-6D (duplicate), and LW-7.

At 0840 on 29 Mar 02, U.S. EPA OSC Sonia Vega and START members Lee Christenson and Annie Pestro visited the Lennon Wallpaper site. The purposes of the visit were (1) to collect soil samples to replace those misplaced by Suburban and (2) to collect additional soil samples outside the un-vegetated area in order to further delineate the extent of the contamination at the site. OSC Vega and START had planned to collect replacement samples LW-6, LW-6D, and LW-7 as well as additional samples LW-11, LW-12, LW-13, and LW-14.

When OSC Vega and START arrived at the site, they found that the entire north end of the site was under water, including locations LW-6 and LW-7. Because of site conditions, the three replacement samples as well as one additional sample planned for collection at the north end of the site were not collected. However, samples LW-11, LW-12, LW-13, and LW-13D were collected from the south, west, and east perimeters of the site, respectively (See Figure 2). The samples were collected using the same procedures and at the same depths as during the first sampling event. The samples were collected approximately 10 feet outside the un-vegetated area to the south and east. In samples LW-11 and LW-12, the same clay-like material was present as was found in the un-vegetated area of the site, indicating that contamination extends beyond the un-vegetated area. The clay-like material was not present in samples LW-13 and LW-13D. After sample collection, the four samples were placed in a cooler on ice and were hand-delivered to Severn Trent Laboratories (STL) in University Park, Illinois.

3.2 SAMPLE ANALYSIS

Suburban analyzed nine site soil samples for total lead and toxicity characteristic leaching procedure (TCLP) metals. The analytical parameters were selected based on criteria set forth in 40 CFR Part 261. Specifically, Suburban analyzed the samples using U.S. EPA SW-846 Methods 6060B for total lead analysis; 1311/6010B for TCLP barium, cadmium, chromium, lead, and silver analyses; 1311/7060A for



TCLP arsenic analysis; 1311/7470A for TCLP mercury analysis; and 1311/7740 for TCLP selenium analysis.

STL analyzed four site soil samples for total lead and TCLP metals. The analytical parameters were selected based on criteria set forth in 40 CFR Part 261. Specifically, STL analyzed the samples using U.S. EPA SW-846 Methods G010B for total lead analysis; 1311/6010B for TCLP arsenic, barium, cadmium, chromium, lead, selenium, and silver analyses; and 1311/7470A for TCLP mercury analysis.



4.0 ANALYTICAL RESULTS

START obtained analytical results for (1) nine soil samples from Suburban under TDD No. S05-0107-010 and (2) four soil samples from STL under TDD No. S05-0203-018. The analytical parameters were chosen based on criteria for identification of hazardous waste set forth in 40 CFR Part 261. The sample analytical results are discussed below and are summarized in Table 1.

Soil samples LW-1 (0-6), LW-1 (12-18), LW-2, LW-3, LW-4, LW-5, LW-8, LW-9, LW-10, LW-11, LW-12, LW-13, and LW-13D were analyzed for total lead and TCLP metals.

All analytical results for total lead were compared to the soil screening level for the commercial/industrial outdoor worker scenario for Superfund sites presented in U.S. EPA's 2001 document titled "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites." All the samples analyzed except LW-13 and LW-13D contained total lead concentrations exceeding the soil screening level of 750 milligrams per kilogram (mg/kg). Samples LW-13 and LW-13D aside, the lowest total lead concentration detected was 3,390 mg/kg in sample LW-10; the highest total lead concentration detected was 10,900 mg/kg in sample LW-3.

All analytical results for TCLP metals were compared to criteria for Resource Conservation and Recovery Act (RCRA) metals listed in Title 40 CFR 261.24. All the samples analyzed except LW-13 and LW-13D contained TCLP lead concentrations exceeding the regulatory limit of 5 milligrams per liter (mg/L). Samples LW-13 and LW-13D aside, the lowest TCLP lead concentration detected was 5.13 mg/L in sample LW-1 (12-18); the highest TCLP lead concentrations detected was 100 mg/L in sample LW-3. No other TCLP metal concentration detected in the samples exceeded criteria listed in 40 CFR 261.24.



TABLE 1
ANALYTICAL RESULTS

Parameter ^a	Regulatory Limit or Screening Level	Sample Designation (with Sampling Depth in Inches Below Ground Surface)											
		I W-1 (0-6)	I W-1 (12-18)	LW-2 (6-12)	I W-3 (0-8)	I W-4 (18-24)	I W-5 (8-15)	I W-6 (0-8)	LW-6D (0-8)	LW-7 (18-24)	I W-8 (12-18)	I W-9 (0-8)	I W-10 (18-24)
ICI P Arsenic	5.0	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	0.0021 J
TCLP Barium	100.0	1.31	2.99	1.76	1.66	4.25	1.93	NA	NA	NA	1.63	1.56	1.82
ICI P Cadmium	1.0	0.055	0.649	ND	ND	0.0830	0.0340	NA	NA	NA	0.09	0.384	0.232
ICI P Chromium	5.0	0.175	0.112	0.0440	0.0370	0.0640	0.0820	NA	NA	NA	2.08	0.146	0.0780
Total Lead ^b	750	5,040	5,000	3,640	10,900	5,200	8,810	NA	NA	NA	4,730	8,800	3,390
ICI P Lead	5.0	48.1	5.13	6.01	100.0	77.9	69.5	NA	NA	NA	70.8	30.9	52.1
TCLP Mercury	0.2	0.00023 J	0.00051 J	ND J	0.0028 J	0.0011 J	0.00075 J	NA	NA	NA	ND	0.00071 J	0.00008 J
TCLP Selenium	1.0	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND
ICLSP Silver	5.0	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND

Notes

Results presented in boldface exceed the regulatory limits set forth in Title 40 *Code of Federal Regulations* Section 261.24 or a soil screening level established by the U.S. Environmental Protection Agency.

U = Value considered non-detect because analyte was detected in one of the quality control blanks (See Appendix B)

J = Result is considered estimated for quality control reasons (See Appendix B)

NA = Not analyzed

ND = Not detected

ICI P = Toxicity Characteristic Leaching Procedure

^a All values for TCLP metals are presented in milligrams per liter

^b All values for total lead are presented in milligrams per kilogram

TABLE 1 (Continued)



Tetra Tech EM Inc.

TDD No. S05 0106 012 (Lennon Wallpaper)

ANALYTICAL RESULTS

Parameter ^a	Regulatory Limit or Screening Level	Sample Designation (with Sampling Depth in Inches Below Ground Surface)			
		LW-11 (12-18)	LW-12 (6-12)	1 W-13 (0-12)	1 W-13D (0-12)
ICLP Arsenic	5.0	ND	ND	0.03J	0.03J
ICLP Barium	100.0	1.2U	3.0J	1.3U	1.3U
ICLP Cadmium	1.0	0.32	0.24J	0.02J	0.02J
ICLP Chromium	5.0	0.08	0.02J	ND	ND
Total Lead ^b	750	5,100	7,800	650	320
ICLP Lead	5.0	46.0	62.0	0.11	0.082
ICLP Mercury	0.2	ND	ND	ND	ND
ICLP Selenium	1.0	ND	ND	ND	ND
ICLP Silver	5.0	ND	ND	ND	ND

Notes

Results presented in boldface exceed the regulatory limits set forth in Title 40 *Code of Federal Regulations* Section 261.24 or a soil screening level established by the U.S. Environmental Protection Agency.

U Value considered non-detect because analyte was detected in one of the quality control blanks (See Appendix B)

J Result is considered estimated for quality control reasons (See Appendix B)

NA Not analyzed

ND Not detected

ICLP Toxicity Characteristic Leaching Procedure

^a All values for ICLP metals are presented in milligrams per liter

^b All values for total lead are presented in milligrams per kilogram



5.0 POTENTIAL SITE-RELATED THREATS

Paragraph (b)(2) of 40 CFR 300.415 lists factors to be considered when determining the appropriateness of a potential removal action at a site. Those factors that are applicable to the Lennon Wallpaper site are discussed below.

Actual or potential exposure of nearby human populations, animals, or the food chain to hazardous substances, pollutants, or contaminants. On 24 Jul 01, START observed a large hole in the fencing surrounding the unvegetated assessment area. Some of the debris found in the assessment area indicated that trespassers may have entered the site. The potential for dermal exposure to contamination—particularly lead contamination—is substantial for individuals entering the area. Lead is a potentially toxic element. Lead can affect almost every organ in the body and at high levels can cause anemia, memory loss, weakness, and damage to the male reproductive system. RCRA characteristic hazardous waste for lead is present at the site as indicated by the TCLP lead results. Eleven of the twelve samples analyzed had TCLP lead results exceeding the regulatory limit of 5 mg/L. In addition, lead results in eleven of the twelve samples exceeded commercial/industrial outdoor worker exposure levels of 750 mg/kg.

High levels of hazardous substances, pollutants, or contaminants in soils largely at or near the surface that may migrate. High levels of lead contamination were detected in surface soil at the site. During the second site sampling event, it was observed that the site retains water during heavy rain events. Thus, the potential exists for contaminated soil to migrate off site in surface water during flood events. During dry conditions, the potential exists for lead-contaminated soil to become airborne and migrate off site, which would pose an exposure threat to workers on adjacent commercial properties.

Actual or potential contamination of drinking water supplies or sensitive ecosystems. During the site assessment, START observed deer tracks and dog or coyote tracks throughout the assessment area. As observed on the 29 Mar 02 site visit, the area retains rain water, which presents the potential for both ingestion of and dermal exposure to lead contamination by animals that feed or drink in the area.

While conducting the removal evaluation, START observed that little vegetation grew in the area containing the contaminated soil. What vegetation did grow in the area appeared to be stressed.



Concentrations of lead in area soil probably have a significantly negative effect on vegetation in the area.

About 100 feet north of the assessment area is a wetland. Although it is unlikely, the contaminated soils in the assessment area do have the potential to impact the wetland during flood conditions.



6.0 PROPOSED ACTIONS AND ESTIMATED COSTS

Sample analytical results indicate that elevated levels of total lead and TCLP lead are present in soil at the Lennon Wallpaper site. These elevated lead levels pose a threat to both human health and the environment. The site assessment results are similar to those obtained by IEPA during sediment and soil sampling conducted in 1990, the ESI in 1995, and the site characterization in 2000.

Mitigation of threats to human health and the environment at the Lennon Wallpaper site should include removal of soil containing lead contamination exceeding the U.S. EPA soil screening level of 750 mg/kg. Two removal alternatives have been developed for lead-contaminated soil at the site. Alternative 1 involves disposal of lead-contaminated soil at a hazardous waste landfill. Alternative 2 involves on-site stabilization of lead-contaminated soil and disposal of the soil as special waste.

A cost estimate has been prepared for the excavation and removal of lead-contaminated soil at the site under each alternative. The estimates were based on 3,000 cubic yards of hazardous material. As requested by OSC Nied, the original estimate of the hazardous material present (1,500 cubic yards) was doubled to ensure that enough funds were allocated to cover cleanup of any additional hazardous materials found during the removal action at the site. Analytical results for samples collected during the Mar 02 removal evaluation do in fact indicate that contaminated soil extends beyond the unvegetated area of the site.

The costs associated with Alternative 1 include costs for clearing and grubbing, soil excavation, confirmation sampling, hazardous waste transport and disposal, and backfilling and seeding of the excavation area. These activities are estimated to require 18, 12-hour work days and to cost about \$864,875.65. The costs associated with Alternative 2 include costs for clearing and grubbing, soil excavation, confirmation sampling, hazardous waste treatment, special waste transport and disposal, and backfilling and seeding of the excavation area. These activities are estimated to require 38, 12-hour work days and to cost about \$377,983.94.

Under both alternatives, the proposed removal action plan includes the following tasks:

- Develop and implement a site health and safety plan, air monitoring program, and sampling and analysis plan.



- Excavate soil, collect and analyze confirmation samples, treat soil (Alternative 2 only), load trucks, and arrange for disposal of soil
- Decontaminate all excavation and treatment (Alternative 2 only) equipment
- Backfill (with clean soil), seed, and landscape the excavation area

The cost estimates for the two alternatives were generated using the Removal Cost Management System 2000 software program (Version 1.2) and R.S. Means Company environmental remediation cost data.

The cost estimates for mitigation of the threats to human health and the environment posed by the site are detailed in Appendix C.



7.0 SUMMARY

The Lennon Wallpaper site is located in a commercial and light industrial area. The focus of the site assessment was to conduct a removal evaluation for soil in an un-vegetated area in the northwest portion of the site. Soil in this area exhibits stains of various colors and contains lead contamination believed to have been generated during production of wallpaper at the site. Sample analytical results further indicate that contaminated soils extend beyond the un-vegetated area of the site. The contamination is believed to exist primarily in the stained, clay-like material that extends to approximately 2 feet bgs. Below 2 feet bgs, the soil consists of dark brown, organic silts and sands. The removal evaluation addressed only the stained, clay-like material.

Samples were collected at various depths between the ground surface and the clay-like material's interface with native silts and sands approximately 2 feet bgs. Twelve investigative soil samples were analyzed for total lead and TCLP metals. Except for samples LW-13 and LW-13D (duplicate), these samples contained lead concentrations exceeding established environmental criteria for both total lead and TCLP lead. The primary exposure routes for humans and animals are ingestion of and dermal contact with soil on site. Holes in the fencing surrounding the assessment area allow easy access to the area.

Sample analytical results show that the Lennon Wallpaper site poses a direct threat to human health and the environment and that it meets the criteria for initiating a removal action outlined in Paragraph (b)(2) of Title 40 CFR 300.415. Two removal action alternatives were developed for mitigation of the threats. Alternative 2, which includes on-site treatment of lead-contaminated soil and off-site disposal of the soil as special waste, is the more cost-effective of the two alternatives.

